GENERAL DYNAMICS
Armament and Technical Products

Objective Crew Served Weapons (OCS

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OCSW Team

PMCSW, PM FCS, TRADOC,UAM BL, USAIC, USMC

Solutions Integrator
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Weapon
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Fire Control
Raytheon

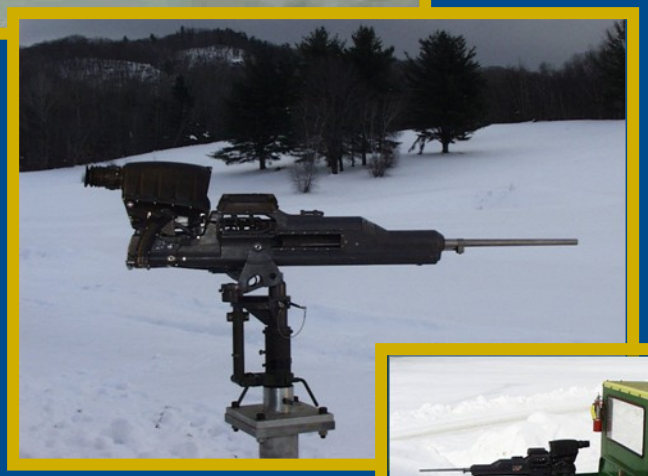
Ammunition
GENERAL DYNAMICS
Ordnance and Tactical Systems
Kaman
Dayron

WHAT IS OCSW?

OCSW Program Started in 1994

- **Lightweight, Crew Portable Weapon System**
- **25mm Airbursting Ammunition**
- **260 SPM Fuzed Rounds**
- **Full Ballistic Solution**
- **Programmable Ammunition with Muzzle Velocity Correction**
- **TAS Laser Range Finder & Target Tracking**

OCSW Family – XM312



- .50 CAL Variant of the OCSW
- Part Interchangeability with OCSW, 5 Parts are Different
- Demonstrated January 7, 2003
- Performance & Physical Characteristics Exceed Other Crew-type .50 CAL Weapons
- Development of XM312 will Accelerate OCSW Maturity

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XM307 & XM312 Weapons

OCSW ATD EXIT CRITERIA

Range Measurable

	BASELINE(S)			OCSW ATD	
I. LIGHTWEIGHT	**MK19**	**M2**	**M240B**	**THRESHOLD**	**GOAL**
-System Weight (no Ammo), Lbs	144lb	128 lb	43.4 lb	57 lb	
- Crew (2 Man) Portable Modules (Transport Module Weight w/ ammo), Lbs	76 lb	84 lb	24.2 lb	38 lb/person	
II. LETHALITY					
- Accuracy / Dispersion) (deflection error @ 600m)	-	-	-	2 mils	0.5 mils **@ 600 m**
- Fuze Function Set by Fire Control	N/A	N/A	N/A	Single Shot	
- Air burst Point Range Error (known range, 600 m)	N/A	N/A	N/A	10 m (+/- 5m)	4 m **2.0 m @ 62**
- Defeat of Defilade Target	Minimal	None	None	Yes	Yes **Yes**
- High P(i) (*1)	x	y	z	3x / 12y / 8z	6x / 24y / 16 z
- Armor Penetration (at 0 deg. obliquity)	2"- 3" RHA @ 1,500 m	3/4" HHA @ 1,500 m	1/2" HHA @ 800 m	2" RHA (*2) 1,000 m	2" HHA 2,00
- P(h), Lt Vehicle Target @ 1,000m (Two 5 rd bursts; stationary 2.3 x 2.3m target)	-	-	-	.35	0.75
III. DAY / NIGHT CAPABILITY				1000 m	2,000 m
- Demonstrate Thermal Module				(modular interface to OCSW)	(*3
IV. LAND WARRIOR COMPATIBILITY				LW Interoperable	LW Wireless Interoperability

Simulation Measurable

Based on Government approved Modeling & Simulation:

V. SURVIVABILITY						
- Casualty Reduction (*4)				40 % Reduction	90 % Reduction	
VI. SUSTAINABILITY						
- Lbs Ammo/ "Kill" (*1)	111	117	25	20	6	**Yes**
VII. AFFORDABILITY						
- Cost /"Kill" (Ammo) (*1)	$1,420	$600	$130	$300	$130	**$252/$20**
- Design to Avg Unit Prod. Cost (HE Ctg)	$ 24(15)	$ 2	$ .55	$ 29		$ 22

* 1 - Weighted AMSAA Analytical Model: Avg: 200-2000m; Standing/Prone/Defilade (5/20/75 %). "Kill" refers to fraction of threat squad incapacitated; current systems have significantly less incapacitation capability against defilade targets. AMSAA model not representative of actual operational engagement scenarios.

* 2 - Test Warhead Only (no fuze).

* 3 - ATD will assess weight vs. range of available uncooled thermal sensors.

Criteria Rev: 21 Jul

Performance: 4/7/03

Program Management Approach

- Open – Honest Communication
- Goal Oriented Discussions
- Ability/Commitment to make Decisions
- Utilize Management Tools
  - MS Project
  - Project Link
  - EVM – Costed Work Packages
  - Tech Reviews
- Report All News – Good and Bad

Build a Successful, Synergistic Relationship

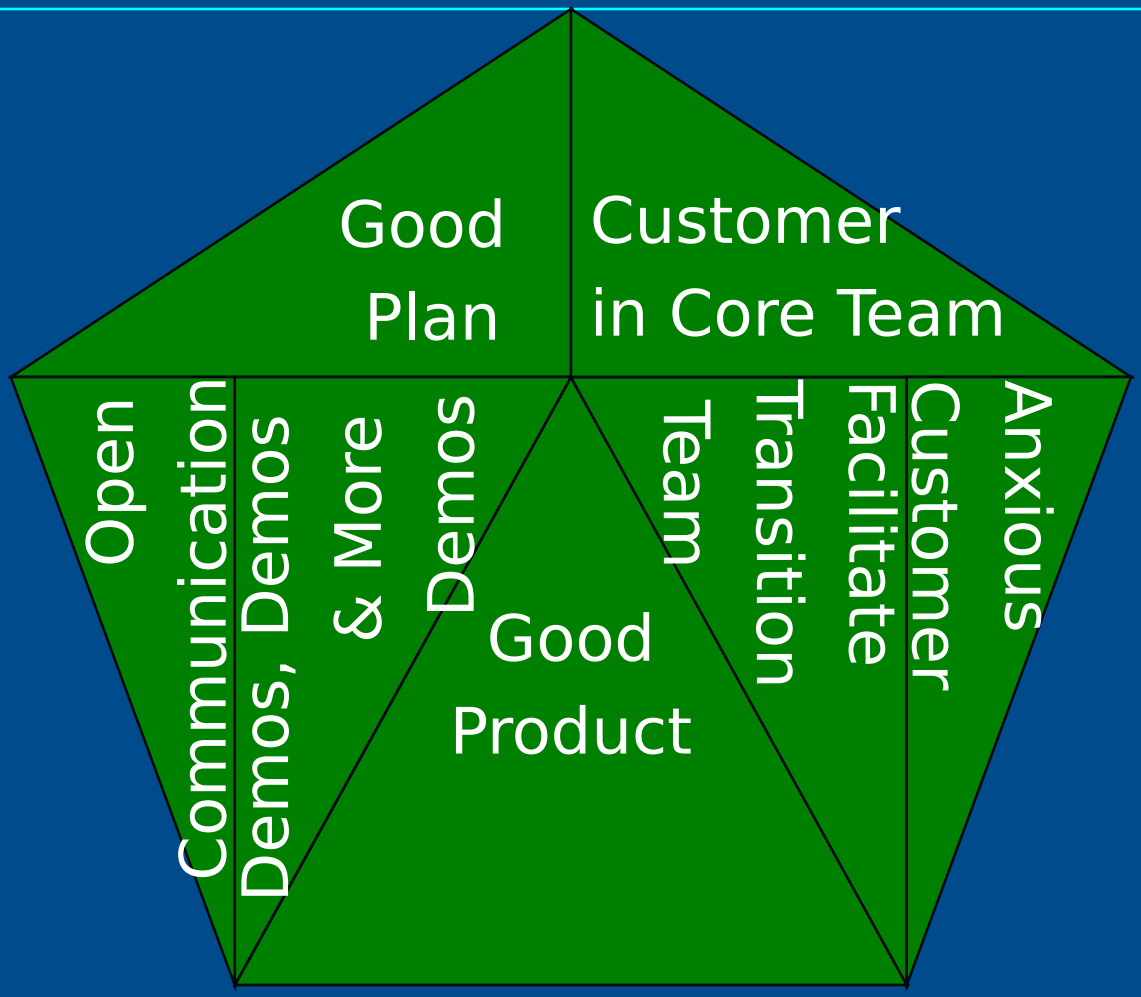
Lessons Learned

- **Need Sub-contractor Buy-in**
  - Team Approach Promotes: Responsiveness, Honesty, True Understanding and Synergy
  - Drives on-time delivery within budget
- **Systems Integration Is Key**
  - System Integration Test (SIT) Process was Key to Success
  - Test to Increasing Goals to Meet Thresholds
  - Test to Find Problems
  - SIT Encourages Growth & Development of a Dynamic Team
- **Don't Understate Small Arms Weapon System Complexities**
  - Employ Sophisticated Systems Engineering Processes
  - Utilize all Engineering Disciplines
  - Recognize the Importance of All Sub-Systems
  - Envelope of Safety is Paramount in Development

Lessons Learned (continued)

- **Get Receiving PM On-Board Early**
  - PM Rep as ATD DPO, 2 Years prior to Transition
  - Delegated RAA for Transition & Requirements Development
- **Keep DA Involved**
  - By-Product of PM Involvement
  - Advertise Success
- **Solicit User Input & Buy-in**
  - Conduct User Juries & Early Operational Assessment
  - Invest in High Quality Models
- **Be Open to Unique & Novel Approaches**
  - Encourage Team Creativity
  - ATD is Time to Take Technical Risks – HOWEVER, Must be Managed!

Keys to Successful Transition



Experimental Unmanned Vehicle (XUV) Program

- XUV Team
  - General Dynamics Armament & Technical Products -
    - Integration, XM307 Weapon System
  - Raytheon Electronic Systems-
    - Designed & Built Wireless Control, Fire Control
  - General Dynamics Robotic Systems - Unmanned Ground Vehicle
  - Recon Optical - Stablized, Turreted Weapon Mount (Lightning Mount)
  - JSSAP LAD Team
- Non-Firing Demonstration
  - FT Bliss, Tx., March 7, 2003
- Firing Demonstration
  - Ethan Allen Firing Range, Vt., March 20,2003